

WHAT IS CLAIMED IS:

1. A sound field control system, comprising:

5 a characteristic measuring device which measures an impulse response of a target sound field serving as a sound field to be reproduced;

a characteristic dividing device which divides the measured impulse response into two or more for predetermined frequency bands and into two or more for predetermined elapsed
10 times, so that the impulse response is divided into a plurality of block data on a time axis and a frequency axis;

a space characteristic deciding device which decides, based on the divided block data, a target space characteristic serving as an acoustic characteristic of a space in the target
15 sound field;

a difference detecting device which detects a difference between the decided target space characteristic and a predetermined desired space characteristic serving as an acoustic characteristic of a space in a desired sound field;

20 a sound source dividing device which divides a sound source component of a sound source for each of the predetermined frequency bands, the sound source being listened to in the target sound field;

a correcting device which corrects at least one sound
25 source component for each of the sound source components based on the detected difference between the space characteristics;
and

a sound source synthesizing device which synthesizes the sound source again based on the corrected sound source component.

- 5 2. The sound field control system according to claim 1, wherein

when the acoustic characteristic of the space is a numerical characteristic indicating a sense of spaciousness which is a sense of a size of a sound field felt by a person,
10 the space characteristic deciding device decides the space characteristic based on a weighted linear sum of an energy value of each of the block data and a weight coefficient determined for each of the block data.

- 15 3. The sound field control system according to claim 1 or 2, wherein the characteristic measuring device comprises:

an amplifying device which amplifies sound based on a test signal;

a signal generating device which generates the test
20 signal;

a collecting device which collects the sound generated from the amplifying device; and

a response calculating device which calculates an impulse response between the amplifying device and the
25 collecting device based on the test signal and the collected sound.

4. The sound field control system according to any one of claims 1 to 3, wherein the correcting device corrects the sound source component included in a frequency band exceeding a predetermined frequency among the predetermined frequency
5 bands.

5. The sound field control system according to any one of claims 1 to 4, wherein the correcting device corrects the sound source component included in an elapsed time exceeding
10 a predetermined elapsed time among the predetermined elapsed times.

6. The sound field control system according to any one of claims 1 to 5, wherein the correcting device comprises:
15 an added information calculating device which calculates, based on the detected difference between the space characteristics, added information to be added to at least one of the sound source components; and
an information adding device which makes a correction
20 by adding the calculated added information to the sound source component.

7. A sound field controlling method, comprising:
a characteristic measuring process which measures an
25 impulse response of a target sound field serving as a sound field to be reproduced;
a characteristic dividing process which divides the

measured impulse response into two or more for predetermined frequency bands and into two or more for predetermined elapsed times, so that the impulse response is divided into a plurality of block data on a time axis and a frequency axis;

5 a space characteristic deciding process which decides, based on the divided block data, a target space characteristic serving as an acoustic characteristic of a space in the target sound field;

10 a difference detecting process which detects a difference between the decided target space characteristic and a predetermined desired space characteristic serving as an acoustic characteristic of a space in a desired sound field;

15 a sound source dividing process which divides a sound source component of a sound source for each of the predetermined frequency bands, the sound source being listened to in the target sound field;

 a correcting process which corrects at least one sound source component for each of the sound source components based on the detected difference between the space characteristics;

20 and

 a sound source synthesizing process which synthesizes the sound source again based on the corrected sound source component.

25 8. A recording medium on which a sound field controlling program is recorded so as to be readable through a computer, wherein the sound field controlling program causes the computer

to function as:

a characteristic measuring device which measures an impulse response of a target sound field serving as a sound field to be reproduced;

5 a characteristic dividing device which divides the measured impulse response into two or more for predetermined frequency bands and into two or more for predetermined elapsed times, so that the impulse response is divided into a plurality of block data on a time axis and a frequency axis;

10 a space characteristic deciding device which decides, based on the divided block data, a target space characteristic serving as an acoustic characteristic of a space in the target sound field;

a difference detecting device which detects a
15 difference between the decided target space characteristic and a predetermined desired space characteristic serving as an acoustic characteristic of a space in a desired sound field;

a sound source dividing device which divides a sound source component of a sound source for each of the predetermined
20 frequency bands, the sound source being listened to in the target sound field;

a correcting device which corrects at least one sound source component for each of the sound source components based on the detected difference between the space characteristics;
25 and

a sound source synthesizing device which synthesizes the sound source again based on the corrected sound source

component.

9. A sound field space characteristic decision system, comprising:

5 a characteristic measuring device which measures an impulse response of a target sound field serving as a sound field to be reproduced;

a characteristic dividing device which divides the measured impulse response into two or more for predetermined
10 frequency bands and into two or more for predetermined elapsed times, so that the impulse response is divided into a plurality of block data on a time axis and a frequency axis; and

a space characteristic deciding device which decides, based on the divided block data, a target space characteristic
15 serving as an acoustic characteristic of a space in the target sound field.

10. The sound field space characteristic decision system according to claim 10, wherein

20 when the acoustic characteristic of the space is a numerical characteristic indicating a sense of spaciousness which is a sense of a size of a sound field felt by a person, the space characteristic deciding device decides the space characteristic based on a weighted linear sum of an energy
25 value of each of the block data and a weight coefficient determined for each of the block data.

11. The sound field space characteristic decision system according to claim 10 or 11, wherein the characteristic measuring device comprises:

an amplifying device which amplifies sound based on
5 a test signal;

a signal generating device which generates the test signal;

a collecting device which collects the sound generated from the amplifying device; and

10 a response calculating device which calculates an impulse response between the amplifying device and the collecting device based on the test signal and the collected sound.

12. A sound field space characteristic deciding method, comprising:

a characteristic measuring process which measures an impulse response of a target sound field serving as a sound field to be reproduced;

20 a characteristic dividing process which divides the measured impulse response into two or more for predetermined frequency bands and into two or more for predetermined elapsed times, so that the impulse response is divided into a plurality of block data on a time axis and a frequency axis; and

25 a space characteristic deciding process which decides, based on the divided block data, a target space characteristic serving as an acoustic characteristic of a space in the target

sound field.

13. A recording medium on which a sound field space characteristic deciding program is recorded so as to be readable through a computer, wherein the sound field space characteristic deciding program causes the computer to decide a characteristic of a sound field space, and to function as:

5 a characteristic measuring device which measures an impulse response of a target sound field serving as a sound field to be reproduced;

a characteristic dividing device which divides the measured impulse response into two or more for predetermined frequency bands and into two or more for predetermined elapsed times, so that the impulse response is divided into a plurality of block data on a time axis and a frequency axis; and

15 a space characteristic deciding device which decides, based on the divided block data, a target space characteristic serving as an acoustic characteristic of a space in the target sound field.

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